CLAIMS

What is claimed:

1.   A 108-tap 1:4 interpolation FIR filter device for digital mobile communication, comprising:

four shift registers for shifting/storing 1-bit filter inputs each inputted from four channels to produce 27-bit parallel data, respectively;

a selector for sequentially selecting said outputted parallel data of the four channels one by one;

an address generator for receiving said 27-bit parallel data outputted from the selector to produce addresses depending on look-up tables of each of coefficient groups;

four look-up table groups for generating filter outputs of the coefficient groups using the addresses generated in said address generator;

a pipeline registersⅠ for delaying filter outputs per coefficient groups outputted in parallel from said four look-up table groups;

a group selector for serially transforming said delayed outputs from said pipeline registersⅠ , channel by channel; and

a pipeline registersⅡ for delaying the output from said group selector to match the time of the filter output per channel.

2.   The 108-tap 1:4 interpolation FIR filter device for digital mobile communication according to claim 1, wherein sad address generator includes:

five XOR calculators for dividing the 27-bit parallel data inputted from the shift registers into five groups for accessing five coefficient groups (LUT_0, LUT_1, LUT_C, LUT_2, LUT_3) and logically XOR-ing the most significant bit (MSB) and the remaining bits per the divided group in order to access addresses of omitted look-up table using the symmetry within the look-up table; and

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four multiplexers for transforming the address of said LUT_2 and LUT_3 in order to access said LUT_0 and LUT_1 twice to thereby access addresses of omitted LUT_2 and LUT_3 using the symmetry of the filter coefficient.

3. The 108-tap 1:4 interpolation FIR filter device for digital mobile communication according to claim 1, wherein said four look-up table groups consist of coefficient group, respectively, and a look-up table within each of the look-up groups is created by dividing said 27 coefficients, said look-up table including LUT_0 having 6 coefficients, LUT_1 having 6 coefficients and LUT_C having 3 coefficients; and

in the look-up table group0 and the look-up table group3, and the look-up table group1 and the look-up table group2, in order to provide omitted look-up table value using the symmetry of coefficients, coefficient parts of LUT_0 and LUT1 within each of the look-up table groups are twice accessed, respectively.

4. The 108-tap 1:4 interpolation FIR filter device for digital mobile communication according to claim 3, wherein said LUT_0, LUT_1 and LUT_C reduce in half the number of the look-up table using the symmetry within the look-up table.

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